

ACCESSION #: 9605240047

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Prairie Island Nuclear Generating Plant PAGE: 1 OF 3

Unit 2

DOCKET NUMBER: 05000306

TITLE: Reactor Trip Caused by Loss of Instrument Air Pressure

EVENT DATE: 04/18/96 LER #: 96-02-00 REPORT DATE: 5/20/96

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Jack Leveille TELEPHONE: (612) 388-1121

COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: LD COMPONENT: V MANUFACTURER: W308

REPORTABLE NPRDS: Yes

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At approximately 1916 hours on April 18, 1996, while operating at 100% reactor power, Unit 2 experienced a reactor trip generated by a protective signal received from a Low Steam Generator Water Level signal. Significant observations by Control Room personnel prior to the trip included annunciators indicating Instrument Air low header pressure and a problem in the Instrument Air Dryers. The Unit 2 instrument air header indicated zero flow and header pressure was decreasing. Steam generator levels decreased as their feedwater regulating valves drifted shut due to the loss of air. About one minute after the feedwater regulating valves began to close, 22 Steam Generator reached the Low level trip setpoint resulting in a reactor trip.

The plant response to the reactor trip was normal with the following exceptions:

- 1) The orifice isolation valve failed closed due to low air pressure, isolating letdown.
- 2) The following fans tripped: 21 CRDM Fan, 11 Aux Bldg Exh Fan, 21 Aux Bldg Exh Fan and 21 Aux Bldg M/U Fan.

The cause of the trip was failure of a 122 Air Dryer purge exhaust valve to close during a drying cycle. Failure of an air inlet or exhaust purge valve to close during dryer operation causes a loss of air header pressure through the 1-1/2 inch purge exhaust line. A manual valve is installed on this line which can be used to isolate the leak during this type of event. Operators were dispatched to the air dryer during the course of this event but had insufficient time to isolate the air dryer manually

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EVENT DESCRIPTION

At approximately 1916 hours on April 18, 1996, while operating at 100% reactor power, Unit 2 experienced a reactor trip generated by a protective signal received from a Low Low Steam Generator Water Level signal. Significant observations by Control Room personnel prior to the trip included annunciators indicating Instrument Air (EIIS System Identifier: LD) low header pressure and a problem in the Instrument Air Dryers DRY). The Unit 2 instrument air header indicated zero flow and header pressure was decreasing. Steam generator levels decreased as their feedwater regulating valves drifted shut due to the loss of air.

About one minute after the feedwater regulating valves began to close, 22 Steam Generator (EIIS Component Identifier: SG) reached the Low Low level trip setpoint resulting in a reactor trip.

The plant response to the reactor trip was normal with the following exceptions:

- 1) The orifice isolation valve failed closed due to low air pressure, isolating letdown.
- 2) The following fans tripped: 21 CRDM Fan, 11 Aux Bldg Exh Fan, 21 Aux Bldg Exh Fan and 21 Aux Bldg M/U Fan.

The cause of the trip was failure of a 122 Air Dryer purge exhaust valve (EHS Component Identifier: V) to close during a drying cycle. Failure of an air inlet or exhaust purge valve to close during dryer operation causes a loss of air header pressure through the 1-1/2 inch purge exhaust line. A manual valve is installed on this line which can be used to isolate the leak during this type of event. Operators were dispatched to the air dryer during the course of this event but had insufficient time to isolate the air dryer manually.

CAUSE OF THE EVENT

The cause of the trip was failure of a 122 Air Dryer purge exhaust valve to close during a drying cycle. Inspection of the Instrument Air Dryer showed that all components were in good condition with the exception of one of the exhaust purge valves. This valve was found with galling on the stem and damaged seals on the air actuator piston. It is suspected that the valve failed to close since additional force was required due to the stem galling while the actuator was providing less force due to the damaged piston seal.

A contributing factor was the fact that the 121 Instrument Air Compressor was out of service for maintenance and therefore not available to help reduce the pressure decay caused by the failed open valve.

ANALYSIS OF THE EVENT

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This event is reportable pursuant to 10CFR50.73(a)(2)(iv) since this was an unplanned actuation of the reactor protection system. Response of the primary system was as expected. Health and safety of the public were unaffected.

CORRECTIVE ACTION

Prior to return to power, the 122 Instrument Air Dryer, including all valves, filters, air lines and electronic components were inspected, cleaned and rebuilt as necessary. One exhaust purge valve was found to have galling on its stem and a damaged actuator piston, the valve and actuator were replaced. Also, in order to prevent the rapid loss of air pressure which occurs upon an air inlet valve or exhaust purge valve failure, the manual exhaust purge isolation valve was throttled to provide additional restriction in the exhaust line (this was done on both the 121 and 122 Instrument Air Dryers).

The 121 Instrument Air Dryer air inlet and exhaust purge valves were subsequently inspected for abnormalities. No discrepancies were identified.

A Nonconformance Report was generated to investigate the cause and extent

of this condition.

It is planned to implement a modification to prevent a failure of one air dryer inlet or exhaust purge isolation valve from causing a loss of air header pressure.

It is also planned to review instrument air dryer maintenance procedures to insure that adequate maintenance is being performed on the air inlet and exhaust purge valves.

FAILED COMPONENT IDENTIFICATION

Worcester 1-1 /2 inch Ball Valve, Model 444T, with Worcester Air Actuator, Model B34.

PREVIOUS SIMILAR EVENTS

Instrument air dryer air inlet or exhaust purge valves have failed to close in previous plant history, however no reactor trips have resulted.

The most recent event was in February 1996 when operations personnel were able to close the air dryer manual purge isolation valve in sufficient time to prevent a reactor trip.

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Northern States Power Company

Prairie Island Nuclear Generating Plant

1717 Wakonade Dr. East

Welch, Minnesota 55089

May 20, 1996 10 CFR Part 50

Section 50.73

U S Nuclear Regulatory Commission

Attn: Document Control Desk

Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket Nos. 50-282 License Nos. DPR-42

50-306 DPR-60

Reactor Trip Caused by Loss of Instrument Air Pressure

The Licensee Event Report for this occurrence is attached. In the report, we made no new NRC commitments.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50, Section 50.72, on April 18, 1996. Please contact us if you require additional information related to this event.

Michael D Wadley

Plant Manager

Prairie Island Nuclear Generating Plant

c: Regional Administrator - Region III, NRC

NRR Project Manager, NRC

Senior Resident Inspector, NRC

Kris Sanda, State of Minnesota

Attachment

*** END OF DOCUMENT ***
